Small Business Innovation Research (SBIR)

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Earth Science Technology Office

Feb. 25, 2002

TST Meeting
Stennis Space Center

Small Business Innovation Research (SBIR)

- SBIR program provides up to $670K of seed money for new technology development
- SBIR is three phase program
  - Phase I with funding up to $70K provides opportunity of establish the feasibility and technical merit of proposed innovation.
  - Phase II with maximum funding of $600K supports the most promising of the Phase I projects based on scientific/technical merit, expected value to NASA, company capability, and commercial potential.
  - Phase III is the infusion of the Phase II results into regular NASA programs. Funding for this phase must come from sources other than SBIR.

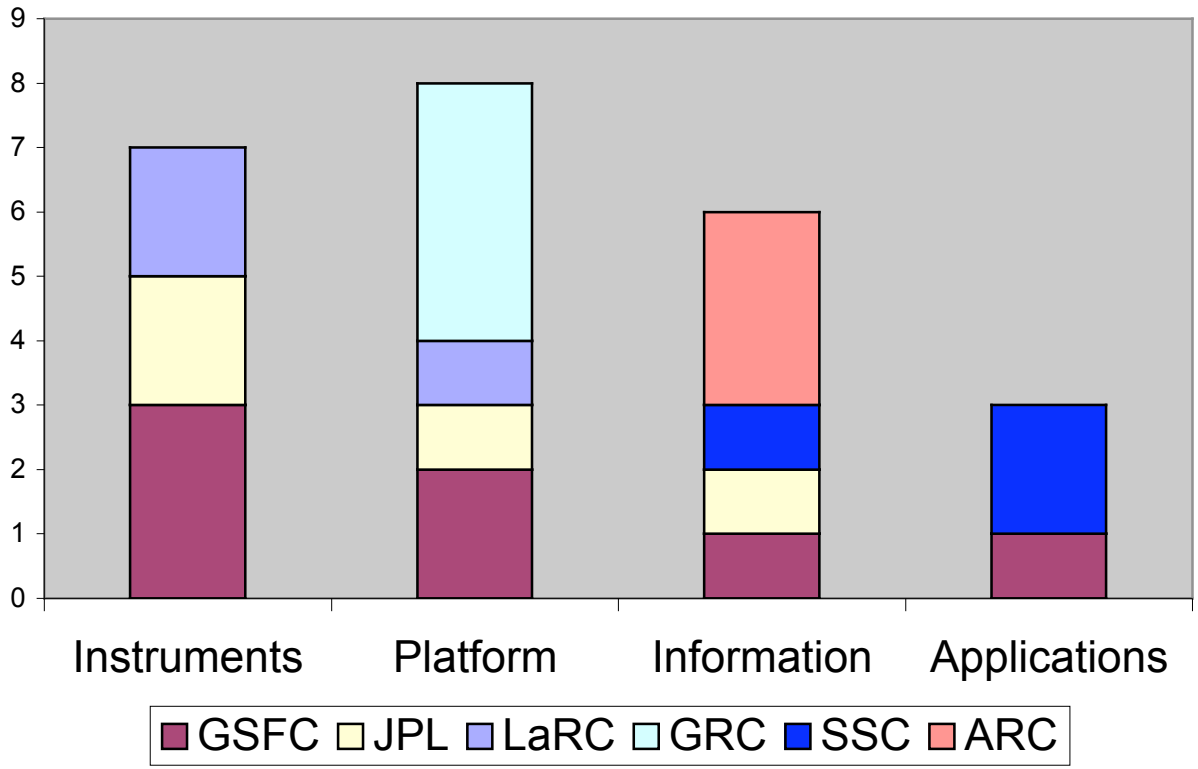
SBIR Topics and Subtopics

- **Instruments for Earth Science Measurements *(GSFC - Matthew McGill)***
  - Passive Optical *(LaRC-Bill Cook)*
  - Active Optical (*LaRC- James Branes*)
  - In Situ Terrestrial Sensors (*GSFC- Stanford Hooker*)
  - Passive Microwave *(GSFC – Kathy Long)*
  - Active Microwave *(JPL - Wendy Edelstein)*
  - Passive Infrared - Sub Millimeter *(JPL – Robert Ferber)*
  - Thermal Control and Cryogenic Systems *(GSFC – Dan Butler)*
- **Platform Technologies for Earth Science *(GRC: Sandra Reehorst)***
  - Structures and Materials *(LaRC – Peter Lillehei)*
  - Guidance, Navigation and Control *(GSFC – Neil Dennehy)*
  - Command and Data Handling *(GSFC – Phil Luers)*
  - Advanced Communication Technologies for Near-Earth Missions *(GRC – Art Anzic)*
  - On-Board Propulsion *(GRC – Brian Reed)*
  - Storage and Energy Conversion *(GRC – John Dickman)*
  - Life-Cycle Integration, Simulation, Validation, and Collaboration *(JPL – Norman Lamara)*
  - Power Management and Distribution *(GRC – Robert Button)*

SBIR Topics and Subtopics

- **Advanced Information System Technology *(ARC – Joseph Coughlan)***
  - Knowledge Discovery and Data Fusion *(JPL – Kenneth Hurst)*
  - Automation and Planning *(ARC – James Brass)*
  - High Performance Computing and Networking *(ARC – John Ziebarth)*
  - Geospatial Data Analysis Processing and Visualization Technologies *(SSC – Thomas Stanley)*
  - Data Management and Visualization *(GSFC – Ben Kobler)*
  - On-Board Science for Decisions and Actions *(ARC – Joesph Coughlan)*
- **Applying Earth Science Measurements *(SSC – Mark Mick)***
  - Innovative Tools and Techniques supporting ES Measurements *(SSC – Nathan Sovik)*
  - Advanced Educational Process and Tools *(GSFC – Blanche Meeson)*
  - Integration of Science and Decision-maker Requirements for Ecosystem Health *(SSC – Anne Peek)*

SBIR Topics Distribution By NASA Centers



SBIR 2002 PH1 Award Summary

- Instruments for Earth Science Measurements

  - 155 proposals received; 54 recommended by the centers for award; 25 (16%) awarded

- Platform Technologies for Earth Science

  - 222 proposals received; 104 recommended by the centers for award; 18 (8%) awarded

- Advanced Information System Technology

  - 103 proposals received; 37 recommended by the centers for award; 7 (7%) awarded

- Applying Earth Science Measurements

  - 42 proposals received; 22 recommended by the centers for award; 4 (10%) awarded

Total of 522 proposals received for Code Y; 54 (10%) awarded

Total of 730 proposals received for Code R; 72 (10%) awarded

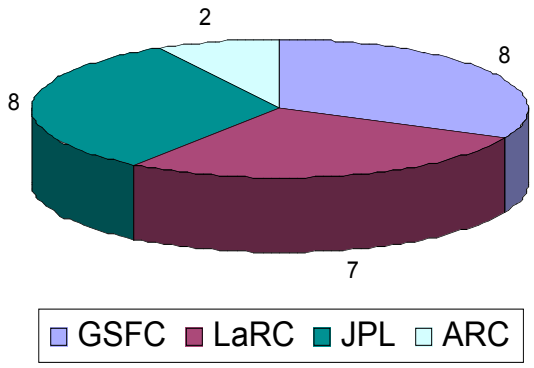
Total of 329 proposals received for Code U; 39 (12%) awarded

Total of 293 proposals received for Code M; 47 (16%) awarded

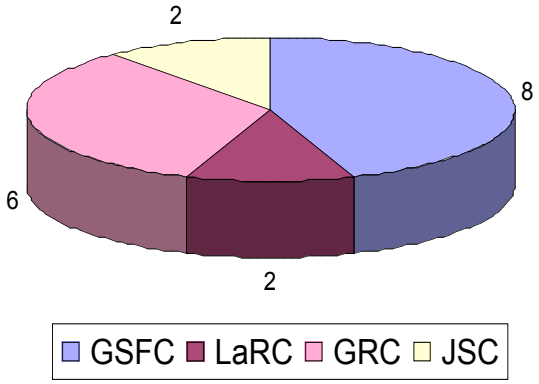
Total of 354 proposals received for Code S; 57 (16%) awarded

SBIR 2002 PH1 Awards Distribution

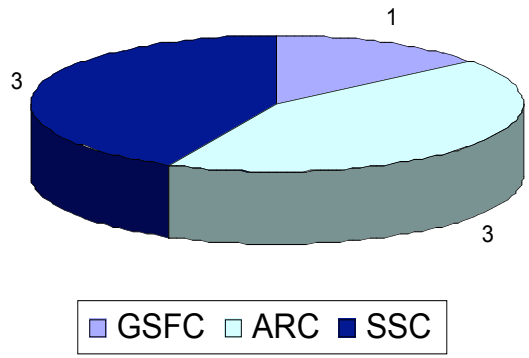
Instruments Technologies



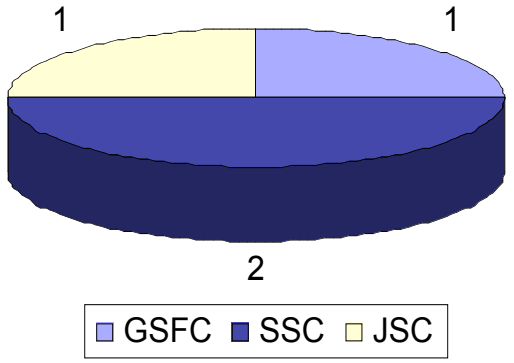
Platform Technologies



AIST



Applications



SBIR 2002 PH1 & 2001 PH2 Award

	Subtopics	ESE SBIR Solicitation Subtopics	2002 Phase I Proposals	2002 Phase I Awards	2001 Phase II Awards
		Instruments for Earth Science Measurements	**155**	**25**	**12**
	E1.01	Passive Optical	43	6	3
	E1.02	Active Optical	43	6	2
	E1.03	In Situ Terrestrial Sensor	23	3	1
	E1.04	Passive Microwave	10	2	2
	E1.05	Active Microwave	14	3	
	E1.06	Passive Infrared - submillimeter	7	1	2
	E1.07	Thermal Control for Instruments	15	4	2
		Platform Technologies for Earth Science Measurements	**222**	**18**	**13**
	E2.01	Structures and Materials	38	4	2
	E2.02	Guidance Navigation and Control	25	2	2
	E2.03	Command and Data Handling	10	1	
	E2.04	Advanced Communication Technologies for Near-Earth Missions	41	3	1
	E2.05	On-board Propulsion	22	2	2
	E2.06	Storage and Energy Conversion	52	4	2
	E2.07	Life Cycle Integration, Validation & Distribution Collaboration Technologies	3		4
	E2.08	Power Management and Distribution	31	2	
		Advanced Information Systems Technologies	**103**	**7**	**4**
	E3.01	Knowledge Discovery & Data Fusion	21		
	E3.02	Automatioon and Planning	13		1
	E3.03	High-Performance Computing & Networking	32	3	1
	E3.04	Geospatial Data Anallysis processing and Visualization Technologies	25	3	2
	E3.05	Data Management and Visualization	9	1	
	E3.06	On-Board Science for Decisions and Actions	3		
		Applying Earth Science Measurements	**42**	**4**	**2**
	E4.01	Innovative Tools & Technique supporting Earth Science Measurements	18	2	
	E4.02	Advanced Educational Processes & Tools	24	2	2
		Integration of Science and Decision -maker Requirements for			

SBIR 2003 Schedule

EHB Opens	January 21
Topic Development	January 22 - February 21
Subtopic Development	January 22 - March 25
Workshop	March 26-27 @ GSFC
Subtopic Development	March 28 - April 23
Subtopic Selection	March 28 - April 23
Management Meeting	May 6-8 at DFRC
PMO Solicitation Review	May 6-22
Solicitation Approval by HQ/Distribution to NASA Senior Management	May 23-July 6
Solicitation Opens	July 7
Solicitation Closes	September 9
In-processing Complete	September 17
Proposal Evaluation	September 18 - November 5
Selection Announcement	November 21
Contract Negotiations and Awards	November 24 - January 16, 2004

SBIR 2002 PH1 Awards List (cont.)

Instruments for Earth Measurements

GSFC	Fabry-Perot Double-Cavity Optically Controlled Narrow Tunable Bandpass Filter	New Span Opto-Technology, Inc.
LaRc	Tunable etalon arrays for Earth Science Measurements	Tanner Research, Inc.
GSFC	High Frequency Amplifiers for Spaceborne Microwave Radiometers	Sophia Wireless, Inc.
GSFC	Synthetic Thinned Aperture Radiometer Boom Using Resilient Structures Technology	Foster-Miller, Inc.
JPL	All-digital, CMOS-based Photodiode Camera	Radiation Monitoring Devices, Inc.
LaRc	High-throughput Tilt-compensated Interferometer	Manning Applied Technology
JPL	Laser Chemical Etching of Spectrometer Gratings	Princeton Scientific Instruments, Inc
LaRc	Hardware Development of Dimensionally-Stable Articulated Deployable Mast	LMC Instrument Corp., D/B/A Revise, Inc.
LaRc	An Ultra-Narrow Tunable Optical Bandpass Filter	MetroLaser, Inc.
LaRc	A High Repetition Rate, Low Voltage EO Q-Switch for Lightweight Pulsed Laser	Boston Applied Technologies, Inc.
GSFC	Tunable, High Power Fiber Optic Laser for Lidar Applications	Sigma Research and Engineering Corp.
LaRc	Quantum-Cascade-Laser-Seeded OPO for DIAL	Q-Peak Inc
GSFC	High-Power Pump Laser for Ozone Lidar	Q-Peak Inc
LaRc	Active Sensors	Aculight Corporation
JPL	Ultra-compact high power micro-chip lasets	Boston Laser, Inc.
ARC	Flight-based instrumentation for in situ measurements of multiple trace gases	Los Gatos Research
GSFC	Microwave Rain Gauge	Center for Remote Sensing, Inc.
JPL	New Structures for Large Sensor Array Platform	AEC-ABLE Engineering, Co.
JPL	Photonic Phased Array Antenna	AGILTRON Corp.
JPL	High Performance and Low Cost Hybrid Microwave Structure	Boston Applied Technologies, Inc.
JPL	Diamond-Based Sub Millimeter Backward Wave Oscillator	GENVAC AeroSpace Corp.
GSFC	Highly Effective Thermoelectric Coolers	Sigma Technologies International, Inc.
JPL	Nanofluid Boiling Module for Precision Cooling of Microelectronics	Microenergy Technologies, Inc.

SBIR 2002 PH1 Awards List (cont.)

Platform Technologies for Earth Science Measurements

LaRc	Low-Cost Fabrication of an Integrated, Self-Sufficient MEMS Skin	Anvik Corporation
GSFC	Passive Non-Rocking Vibration Isolation System for Earth Science Payloads	CSA Engineering, Inc.
JSC	Rational Engineering of Carbon Nanotube Surfaces	ZYVEX Corporation
LaRc	Flexible, Low CTE Composites for Precision Deployable Structures	Foster-Miller, Inc.
GSFC	A Reconfigurable, Decentralized Framework for Formation Flying Control	Princeton Satellite Systems
GSFC	Intelligent Fault Tolerant Control of Spacecraft	Scientific Systems Co Inc.
GSFC	Bit Transparent Ternary SERDES for Intra-System Data Transfer	Advanced Science and Novel Technology
GSFC	High-Frequency, Low-Noise Nitride-Based Power Transistors Grown on Bulk III-N	SVT Associates, Inc.
GRC	Low-Loss Packaged Ka-Band (26.5 GHz) MEMS Phase Shifter	Teravicta Technologies, Inc.
GRC	Holographic Inter-Spacecraft Transceiver System	Physical Optics Corporation
GRC	Pulsed Plasma Thruster Piezo-Igniter for Small Satellite	Face Electronics, LLC
JSC	MEMS Propulsion Technology Utilizing Decomposing Nitrous Oxide Propellant	AeroAstro Corp.
GRC	Lightweight Unitized Regenerative Fuel Cell	Proton Energy Systems, Inc.
GSFC	High energy density Li-ion polymer batteries with nanocomposite cathodes	Nanopowder Enterprises, Inc.
GSFC	Low Cost/Mass Electrostatically Clean Solar Array (ESCA) System	AEC-ABLE Engineering, Co.
GRC	Novel Polyethers Doped with Nanoscale Insulating Oxides for Lithium Battery	H.V. Setty Enterprises, Inc.
GRC	High Temperature Capacitors for Power Converters	TRS Ceramics, Inc.

SBIR 2002 PH1 Awards List

Advanced Information Systems Technology

ARC	Intelligent and Dynamic High Performance Optical Network	Intelligent Fiber Optic Systems
ARC	Next Generation Write Head for Commercial Holographic Data Storage	Displaytech, Inc.
ARC	Grid Computing for Commercial Applications	3DGeo Development Inc.
SSC	BasinTools Module 1, Online Remote Sensing Interface	NVision Solutions, Inc.
SSC	Automated, Universal Software for Cloud and Cloud Shadow Detection in RS Data	SMH Consulting
SSC	Next Generation, Low Cost, Direct Geo-referencing of Aerial Images	Seagull Technology, Inc.
GSFC	Commercial GIS extension for visualization of large unstructured geospatial data	ProLogic, Inc.

Applying Earth Science Measurements

SSC	Ultra Wide band Water Sensor	Intelligent Automation, Inc.
SSC	Universal Stabilized Platform for Hyperspectral Sensors	Opto-Knowledge Systems, Inc. (OKSI)
GSFC	Rich Annotation of Images	Innovative Decision Technologies, Inc.
		Stottler Henke Associates

SBIR 2001 PH-II Awards List (Cont.)

Instruments for Earth Measurements		
LaRc	Imaging Spectropolarimetric Sensor for Airborne and Ground Based Retrieval of Aerosol Properties	Aerodyne Research, Inc.
LaRc	Advanced Cryogenic Fabry-Perot Interferometer Development	Michigan Aerospace Corporation
GSFC	An Airborne VNIR and SWIR Imaging Spectrometer	Flight Landata, Inc
LaRc	Laser Gain Media for Wavelength Specific Applications	Scientific Materials Corp.
GSFC	A switchable holographic circle to point converter for use in LIDAR receivers	Scientific Solutions Inc.
LaRc	Advanced Liquid Crystal on Silicon Optical Phased Arrays	Boulder Nonlinear Systems, Inc.
GSFC	In Situ Lidar for Cloud and Aerosol Radiation Sciences	SPEC, Inc.
GSFC	MMW Pyroelectric Sensor Array	WaveBand Corp.
GSFC	Compact Terahertz Heterodyne Receivers	Virginia Diodes, Inc.
JPL	Micromachined Interconnects for RF MEMS Relays	Xcom Wireless, Inc.
JPL	Broadband Terahertz Frequency Multipliers	Virginia Diodes, Inc.
GSFC	Computer Code to Model Loop Heat Pipe Transients	TTH Research, Inc.
	High Heat Flux Evaporator for Two Phase Transport	

SBIR 2001 PH-II Awards List (Cont.)

Platform Technologies for Earth Science Measurements		
LaRc	Large Inflatable Self-Rigidizing Polymer Film Structures	United Applied Technologies
GSFC	3D Antenna Array and GPS Receiver for Combined Navigation/Attitude Determination	NAVSYS Corporation
GSFC	Com+ Simulation Architecture With Application To Tethers And Formation Flying	Star Technologies, Corp.
GRC	Transoner Power Transfer for TWT Power Systems	Face Electronics, LC
JSC	Low-Cost Hardware for In-Space Oxygen/Hydrogen Propulsion, Phase II	Ultramet
GRC	Novel Catalysts for HAN/HEHN Based Monopropellants	Sienna Technologies, Inc.
GSFC	Enabling Cluster Based Architecture for Virtual Platforms and Sensor Webs	WW Technology Group
GSFC	A Distributed Guidance And Control System For Satellite Constellations N	Accurate Automation Corporation
GRC	Wide-Bandgap CIAS Photovoltaic Absorber on Flexible Substrates	ITN Energy Systems, Inc.
GRC	Soft Magnetic Nanocomposites for High-Frequency Power Applications	Nanomat, Inc.
GRC	Long-Lived Solar Concentrator for Space Power	L'Grade, Inc.

SBIR 2001 PH-II Awards List

Advanced Information Systems Technology		
ARC	A Plan Execution System For Web-Based Scientific Data Integration	Fetch Technologies
ARC	1024 x 1024 Liquid Crystal Multi-Level Spatial Light Modulator	Boulder Nonlinear Systems, Inc.
SSC	Hyperspectral Remote Sensing Processing Incorporating coremicro IMU and GPS Data	American GNC Corporation
SSC	Web-Based Hurricane Storm Surge and Flood Forecasting Using Optimized IFSAR Bald Earth DEMs	WorldWinds, Inc.
Applying Earth Science Measurements		
SSC	An In-situ, Biogeochemical Sensor using Excitation-Emission Matrix Fluorometry	WET Labs, Inc.
	Atmospheric Correction of Remote Imagery Using	